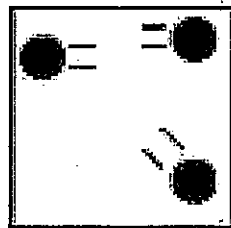
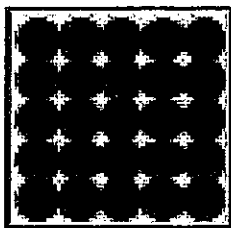


States of Matter

Unit 3



General Properties and Characteristics

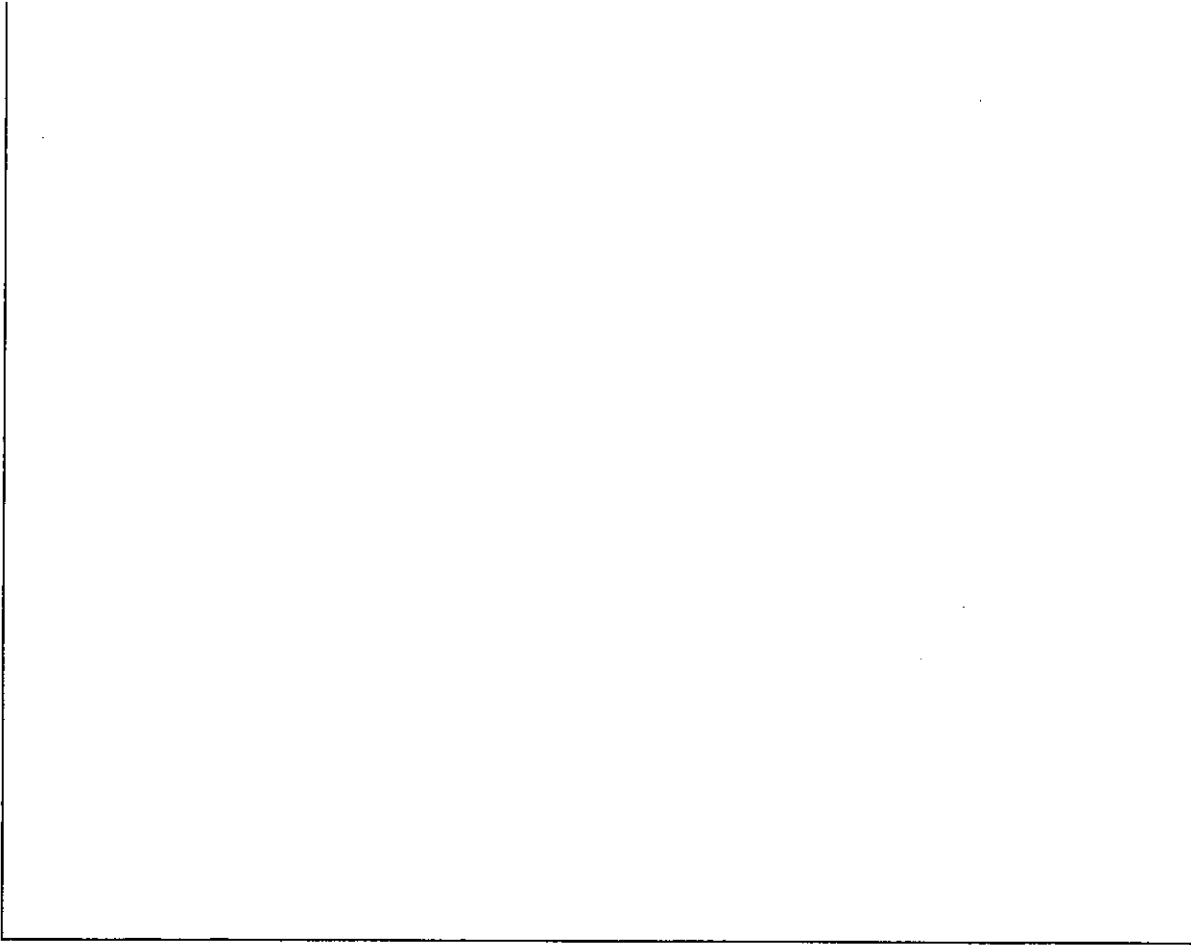
Solid	
Liquid	
Gas	

Phase Changes:

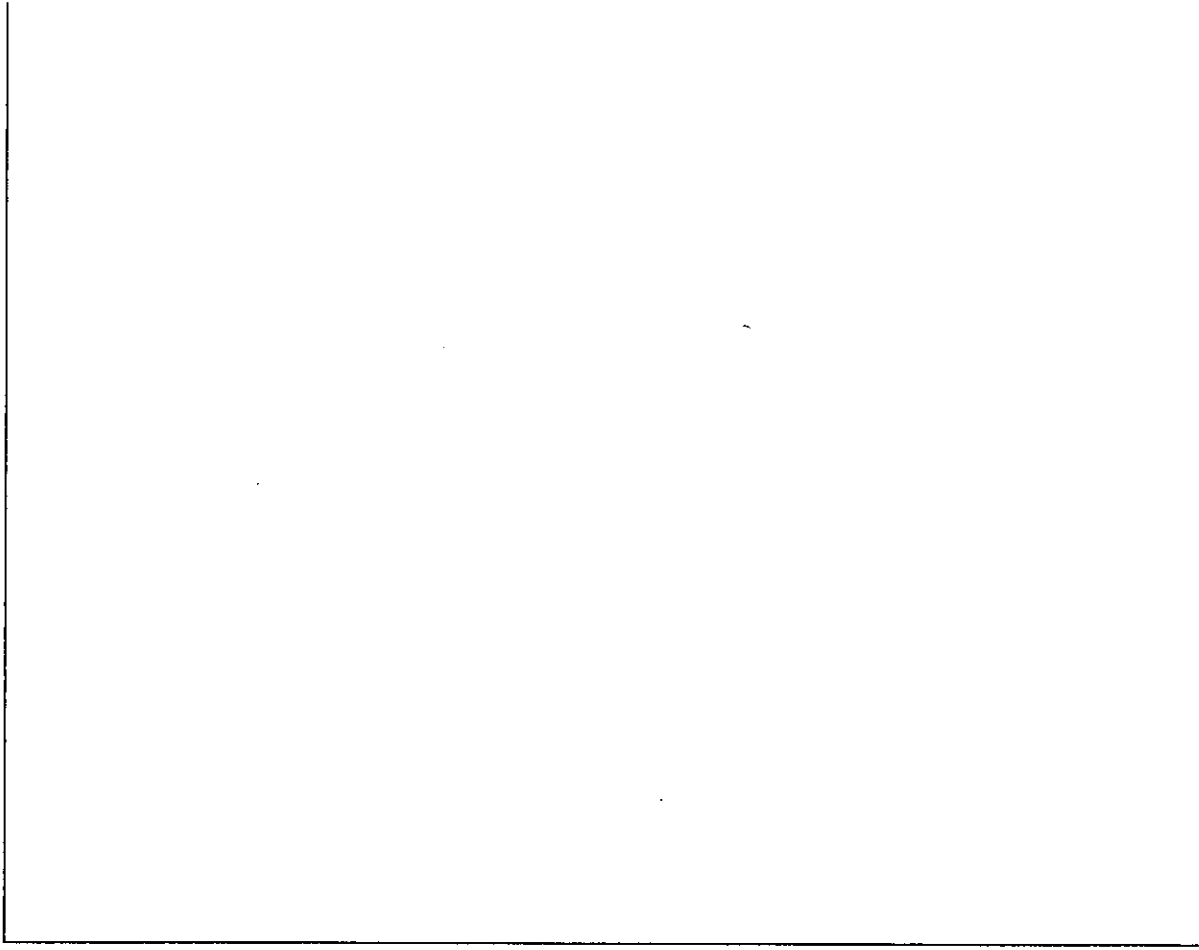
Freezing	
Boiling	
Condensing	
Evaporation	
Sublimation	
Deposition	
Melting	
Vaporization	

Phase Diagrams

Heating Curve



Cooling Curve



Specific Heat Capacity

Heat of Fusion

Heat of Vaporization

What is happening with heat/energy as a substance is heated or cooled?

How do we calculate it

$$Q = mC\Delta T$$

$$Q = mH_f$$

$$Q = mH_v$$

Practice Questions:

How much energy is required to melt 56 grams of ice?

How much energy is required to boil 34 mL of water?

If 4892 J of energy were needed to convert a sample of water to steam, how many grams of water were in the sample?

If the temperature of a 17 gram sample of water changes by 47 degrees Celsius, how much energy was needed?

What is the specific heat capacity of an unknown sample if it took 9831 Joules of energy to raise the temperature of a 25 gram sample 76 degrees?

The Kinetic Theory of Gases:

How does pressure, temperature, and volume changes affect a gas:

When dealing with gases, temperature readings need to be in Kelvin. Here is how to convert:

$$\text{Kelvin} = ^\circ\text{C} + 273$$

$$^\circ\text{C} = \text{K} - 273$$

Calculations with gases:

Charles Law:

A sample of He gas has a volume of 7 liters at 372 K. What is its volume if the temperature is lowered to 300 K?

If 67 mL of a gas at 765 K has its volume decreases to 45 mL. What is the new temperature?

Boyles Law:

The pressure of a sample of a gas is 7.4 atm. If the pressure is decreased to 4.5 and the volume becomes 6 liters, what was the original volume?

A sample of a gas it at 750 torr and has a volume of 3.9 L. What is the new pressure if the volume increases to 6.2 L?

Combined Gas Law:

A sample of a gas is at 273 K and 1 atm and has a volume of 55 mL. What is its new volume if the temperature is raised to 373 K and the pressure is increased to 2.7 atm?

A sample of air is occupying a volume of 7.8 L and the temperature is 298 K and the pressure is 6.5 atm. If the volume is decreased to 5.8 and the temperature is raised to 321 K, what is the new pressure?

